

January 2024



PLANT HEALTH AND PROTECTION

Jubilee Newsletter Edition



In this edition of our Jubilee Newsletter the reader will find some more fascinating facts about the origins of our campus, again spanning many decades and many places under the leadership of our founders and pioneers in South Africa. It tells the story of adaptation to an ever-changing research environment and in a way it becomes therefore relatable and provides insight into what the future may look like.

It would also be appropriate to use this opportunity to make reference to the genesis of this publication, which came into existence while PPRI were still part of the Department of Agriculture; as the Plant Protection News. The earliest copy in our records, indicate Plant Protection News No.19 - March 1990). By September 1992, Plant Protection News got a revision done by Sanet du Plessies, one of 3 graphic designers stationed at ARC Head Office in Hatfield at the time and Elsa van Niekerk, our own graphic designer, took over the lay-out of the PPNews in July 2005 (No. 64) with Dr Ansie Dippenaar as editor and the publication was yet again revitalized. A fourth revision was undertaken with the Autumn 2020 publication (No. 115), which is the current lay-out and look as you read it today.

Happy reading and all the best for 2024!

- Dr Ansa van Vuuren (Senior Manager: Plant Health and Protection)

Top to bottom: DNA lab, Nematology lab with a sample from the centrifuge and insect ecology quarantine lab

PHP Facilities

Historical Plant Protection Research Institute stations

Buffelspoort Quarantine Station, North West Province

Buffelspoort Quarantine Station was located in the Rustenburg district, the North-West Province (about 80 km west from Pretoria). An area where mainly citrus, sunflower, vegetables as well as winter wheat, soybeans and some tobacco are grown. This station was 52 hectare in size, with 34 hectares being incorporated under the Buffelspoort State Water Scheme overtime.

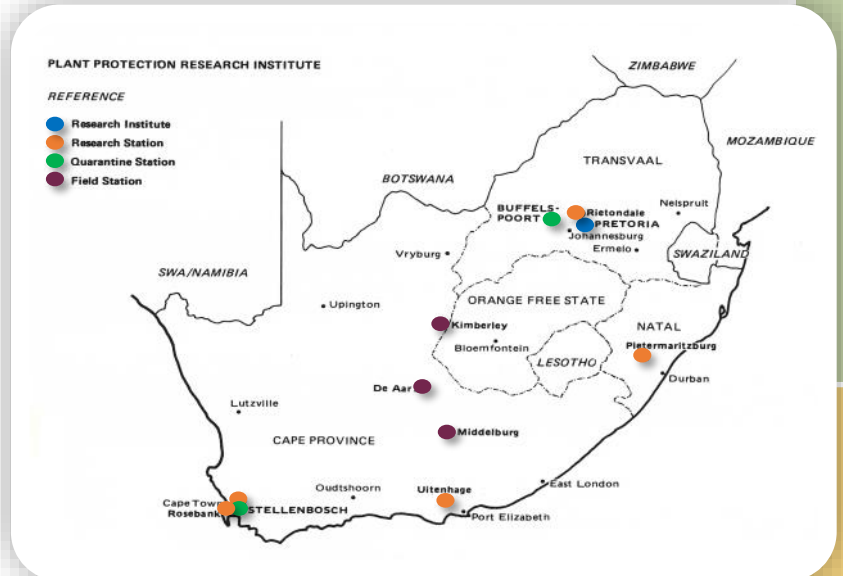
Buffelspoort was developed during the late 1970's into a full-fledged Quarantine station and can be described as a "post entry" quarantine station where imported plant material was grown in isolation under observation. The facilities and equipment were adequate, for the time, for handling a wide range of arable and horticultural crops under both closed and open quarantine. In the closed quarantine facilities, plants were grown under controlled conditions in glasshouses and in insect-proof mesh cages.

However, most plants were planted under open quarantine and kept on a site of approximately 17 hectare enclosed with security fencing. More than 25 staff worked with the plants under quarantine. The team consisted of researchers, technicians, technical assistants, farm foreman and assistants, as well as a team of general workers. To ensure the efficient functioning of this quarantine station, the staff liaised closely with some subject specialists in the institute, officers connected to the Plant and Seed Control Division and the respective importers where it became necessary.

A large variety of crops have been kept under quarantine, cared for and evaluated for the presence of plant harmful organisms.

Middelburg satellite office, Western Cape Province

This facility was one of the many satellite sites across the country. These sites often housed three to five staff members at a time. This site was about a kilometer from the Karoo Area Offices on the outskirts of Middelburg. The focus of this facility was on locust control. Often during locust outbreaks, locust control supplies and equipment were stockpiled here, amounting to R1,5 million. This was a very large amount for the 1970's. It was a very busy hub with up to 167 vehicles at times being used as part of field control excursions. During the off periods, staff made use of their time repairing equipment and replenishing chemicals for the next busy period of locust swarms outbreaks moving through the country.



PPRI (now PHP) facilities spread out over South Africa from its inception until now



Buffelspoort social function 1979

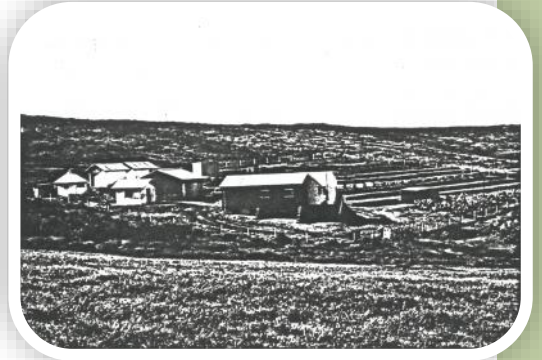
PHP Facilities

Historical Plant Protection Research Institute stations

Uitenhage, Eastern Cape Province

The Weeds Laboratories, near Uitenhage in the Eastern Cape Province, was a neat complex of buildings and consisted of several research staff. Some of the staff were even stationed at the nearby Grahamstown site.

The now Eastern Cape Province had several serious weed problems which is what led to the forming of the large facilities at Uitenhage. Research was carried out on the following weed species: prickly pear cactus (*Opuntia aurantiaca*), prickly pear (*Opuntia ficus indica*), sesbania (*Sesbania punicea*), satansbos (*Solanum elaeagnifolium*), "Mesquite" (*Prosopis* spp) and the nassella polegrass (*Stipa trichotoma*).



The old weeds Laboratories near Uitenhage

Due to the successes of the Australians with the biological control of *Opuntia stricta*, the optimism flared up here for a similar solution to the prickly pear problem in South Africa. During the Great Depression and world wars, the project on local biological control of prickly pears was a big undertaking under Dr F.W. Pettey. In 1932, the biocontrol agents *Cacto blast* and later *Cactotum* was imported from Australia. This was later followed by the cochineal *Dactylopius opuntiae*. These insects were subjected to host tests and later formed a mass breeding program. The Port Elizabeth, now known as Gqeberha, climate was too wet and cool for this purpose, so the breeding program was moved to Uitenhage. Further breeding stations were also set up at Graaff-Reinet and Fort Beaufort. Each of the three stations had a staff of one expert, one technician, three technician assistants and ten general workers, indeed a large unit for those years!

Renowned Entomologists such as Dr John Taylor and Dr J W C Geyer started their careers here under Dr Pettey. After the success of the biological control campaign in which more than 600,000ha (± 75 of the original infestations) were cleared of prickly pears, the breeding stations were closed in 1954 and with Dr Petty already retired (1952), the rest of the staff were redistributed or appointed to the forest entomology section in Port Elizabeth.

However, several years later on the recommendation of Dr Eric Bedford and Dr J Serfontein (*Eastern Cape region at the time*) it was decided to reopen the research station at Uitenhage and to introduce and release new insects against the remaining prickly pear infestations. So, in 1965 the station resumed its activities. The "new" station consisted of a few dilapidated sheds on the outskirts of Uitenhage, where today the suburb of Riebeeckhoogte is located. Mr Blouie Burger kept the pot boiling for many years with only the help of a technician assistant (Henning Coetzee) and during this period he bred and released (*with success*) the Turkish fig beetle *Metamasius pinolae* in large numbers. Under the guidance of Dr. Dave Annecke, the activities were expanded from 1968 to the chemical control of *Cactoblastis* and *Cochenille* in thornless prickly pear plantations and an interesting and much-discussed project where an insecticide was used to control prickly pear.

In 1974, the emphasis of the research shifted from prickly pears to litchis cactus. Gradually other projects were also added. An example of this, is the chemical control of various Eastern Cape weeds, biological control of Satansbos and Sesbania. The old research station began to burst at the seams and also had to make way for residential plots. The new Weeds laboratory, which were located approximately 5 km outside Uitenhage next to the Spring resort, was commissioned on 14 May 1979. It was said that one could not imagine a more peaceful and beautiful environment for meditation and inspiration!

The research at this station eventually included entomology, plant ecology, plant physiology and chemical control for many years until the closure during the 1990's.

PHP Facilities

Historical Plant Protection Research Institute stations

Kimberly station, Northern Cape Province

This site was dedicated to locust control research with three to four staff members being stationed there at any given time over the years.

Rosebank station, Western Cape Province

Mr Geoff Tribe, who focused on biological control of plantation (forestry) pests, was one of the last staff working at this site before it was finally closed down.

These last two stations seem to be in and out of the Department of Agriculture and then ARC history. The researching team for this 60th celebration edition were unable to trace more information on these stations. There is very limited historical information available on these sites. The rest of the newsletter deals with the better know facilities that many today recognize and associate with ARC-PHP.

Simplistic timeline for the Department of Agriculture, now the Agricultural Research Council—Plant Health and Protection facilities

Site/building	Approximate occupation date
V-Building, Pretoria, Gauteng	Unknown
Kimberley, Northern Cape	Unknown
Rosebank Station, Western Cape	Unknown
Buffelspoort, North West	Unknown
Middelburg, Western Cape	Unknown
Vredehuis, Pretoria, Gauteng	1905
Rietondale, Pretoria, Gauteng	1920
Uitenhage, Eastern Cape	1932
Vredenburg, Stellenbosch, Western Cape	1969
Cedara, KwaZulu-Natal	1983
Roodeplaat PHP campus, Pretoria, Gauteng	1994
Biosystematics Roodeplaat, Pretoria, Gauteng	2009
Weeds Roodeplaat, Pretoria, Gauteng	2015
Weeds Nursery building, Pretoria, Gauteng	2015
Plant Pathogen Quarantine Facility, Pretoria, Gauteng	2024

PHP Facilities



PPRI were spread out over wings, Wing J (Admin), Wing K (Pesticide Dynamics), Wing LA (Technical Advise), Wing LB (Nematology and Biological Control), Wing P (Locusts), Wing R (Weeds), Wing S (Arachnology) and Wing T (Procurement & Stock)

The 'V-Buildings'

The Agricultural Research Council (ARC) and Plant Protection Research Institute (PPRI) had its roots within the government Department of Agriculture. It was finally constituted into the ARC in 1962. PPRI constituted of the merging of the Entomology and Plant Disease departments.

At the time, many of the staff member were housed in the Department of Agriculture's building in Beatrix street (now Steve Biko street).

For many years, there was the possibility of moving to Roodeplaart from the V-Buildings. The final location was unknown. In late 1985, the Pesticide Dynamics staff decided to take matters in their own hands and converted the V-buildings offices into working labs. As a team, they exchanged their white coats for blue overalls, their lab equipment for tools and the offices for workshops and gave their facility a proper face lift. Every person had a number of tasks and 53 steel frame units were cut, welded and painted. Old cupboards removed and new working surfaces prepared and installed. New taps, wash basins and plumbing produced running water. Damaged wooden floors were ripped up, redone with cement screed and covered with linoleum tiles. Dust, paint, steel, ghries, sawdust, cement etc. was the order of the day but soon seven brand new laboratories arose from the rubble.



The pesticide dynamics team busy cutting, welding and grinding the lab frames



The ladies of the pesticide dynamic help with the sanding and painting the new laboratories frames



Nine years later, the Roodeplaart campus was finally bought and the move became a reality for all. The Pesticide Dynamics Division was the first to move to Roodeplaart in Nov 1994. Once again with a meticulously planned schedule, the close knit team tackled the mammoth task of packing and moving to the Roodeplaart campus. Faithfull to themselves the new building was firstly painted, cleaned, all boxes unpacked and equipment installed. In December 1994, the invasion of the Roodeplaart campus was properly celebrated.



The new refurbished Pesticide Dynamics lab



Top and bottom: Equipment and furniture arriving at the new Roodeplaart East campus

As from 1995 other units, slowly but steadily started moving to the campus over several years. The final research group, the Weeds Biocontrol unit came on board by May 2016. The entire PHP family are now well rooted at the Roodeplaart campus, able to work and grow together, endeavoring to take ARC-PHP to ever increasing new heights.



Stappies Staphorst, Mike Walter (director), ms Susan Marais and Dr Nico van Rensburg celebrating the move to the new building



The newly constituted ARC entrance signs at the V building (April 1992)

PHP Facilities



Vredehuis situated on the Union Building grounds, Pretoria



Vredehuis, Pretoria

Biosystematics comprised of four units, namely the National Collections of Insects, Arachnids, Nematodes and Fungi, which are among the largest collections of their kind in Africa.

These units were established within the government departments of agriculture between 1905 and 1976 in response to a growing need for information on the classification and biology of economically important organisms associated with agriculture and forestry in South Africa.

Initially placed within different divisions and campuses in the ARC-Plant Protection Research Institute (PPRI), with Entomology and Mycology housed at Vredehuis and Arachnology and Nematology stationed on the Rietondale farm, these units were finally consolidated into the Biosystematics unit in 1992, forming a unique southern African center for applied taxonomic research and services.

Biosystematics relocated to Roodeplaat West campus

During 2009 the enormous task of moving all the living and dry collections, cabinets and shelves, office equipment, chemical stores, furniture, literature collections, microscopes and staff started. This undertaking took years of careful planning to get the correct order of moving everything without creating bottlenecks on the other side. The Rietondale units (*spiders, mites and nematodes*) packed and moved soon afterwards as well.



Packing up the collections at Vredehuis



Rietondale situated collections being pack and moved



PHP Facilities

Rietondale Campus, Pretoria

Agricultural research on this campus started during the late 1920's.

Originally, this campus was a research farm located on the Soutpansberg road, near two other PPRI sites. Various research units were housed here, such as beekeeping, locust research, insect ecological, arachnology (spiders and mites) and biological control of weeds.

Rietondale housed quarantine facilities that were in use for well over 30 years but came to the end of its useful life, becoming increasingly inefficient and unreliable due to age and high maintenance costs. International quarantine standards and best-practices made the commissioning of the new facility at ARC Roodeplaat essential for the Weeds Research Division to continue with biological control research safely and cost-effectively. Furthermore, the move allowed the ARC to consolidate the majority of its facilities and research institutions in close proximity to one another, boosting the critical mass of researchers at the PHP Roodeplaat East campus on ARC owned land.

Since weed biological control involves the release of a host-specific natural enemy, or biocontrol agent, for the management of an invasive alien plant, weed biological research therefore relies on importing potential natural enemies, typically insects or fungal pathogens, from a target weeds country of origin. However, this can only be done if a secure containment facility exists in which to house them. Under containment, these candidate biocontrol agents can be thoroughly and safely tested without the risk of them escaping into the outside environment and only once each biocontrol agent is found to be sufficiently host-specific, can an application for release be prepared.

Design work on the new facility started at the end of 2011 and construction started at Roodeplaat in early September 2013, with the contractors clearing the land and marking out the construction site. The construction took almost two years to complete. Following that, the new facilities were at first thoroughly tested before the transfer of the insect cultures started moving to Roodeplaat.

And so started the phase of relocating the Agricultural Research Council's Plant Protection institute from Rietondale to its newest facility at Roodeplaat (on the Moloto Road) during the first half of 2015.



Rietondale glasshouses and research buildings



Top and bottom: Many happy social and year-end functions were often held at the Rietondale farm over the years.



The security house and boom at the Rietondale farm



The end of an era - moving out and the demolition of the Rietondale glasshouses and offices



PHP Facilities

The Vredenburg farm, Stellenbosch

Today Vredenburg farm, near Stellenbosch in the Western Cape Province, hosts several research groups. Research on the campus includes staff from the Weeds Biocontrol Research, Honeybees and the Soilborne research groups.

Historically, Vredenburg is one of the most famous and oldest farms in the Stellenbosch district. In search of arable land for development, Commander Simon Van der Stel discovered the fertile valley of Stellenbosch in 1679. Farmers were allowed to request land for cultivation from 1680 onwards, when large tracts were made available. Vredenburg was allocated to Gerrit van der Bijl in 1680 and registered in his name on 29 February 1692. He was the founder of the Van der Bijl family in South Africa and was a prominent founding citizen of Stellenbosch. The prestigious farm was owned by the Van der Bijl family from 1692 to 1784, and thereafter by the Roux family until 1897.



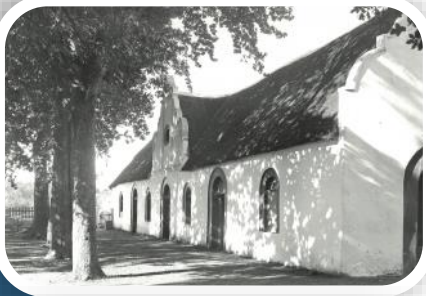
Aerial view of the Vredenburg campus

During this period, the then Cape Province experienced periodic booms in wine sales, and many large and picturesque wine cellars were erected. The fashionable neo-classical style of the early 19th century was incorporated into the Vredenburg gables, as is still to be seen today. By the 1890, the dreaded pest *Phylloxera vastatrix*, had destroyed much of the wine production in the Cape, leading to the introduction of the deciduous fruit industry. Vredenburg was eventually sold to Cecil John Rhodes in 1897, who planted thousands of fruit trees and started the Rhodes Fruit Farms group focused on the export of fruit to Britain.

In 1969, the Department of Agriculture brought the farm for use as a Research and Quarantine Station. The fruit packing shed, built by Cecil John Rhodes early in 1900, and an outbuilding from the 18th century, were altered and transformed into research laboratories. During 1995, 4.2 ha of the original farm with four prominent old historical buildings were transferred to the Agricultural Research Council, to be used as the Southern Campus of the then Plant Protection Research Institute.

The oldest building was built close to the Eerste River and is currently used as a store. Around 1920 a fire destroyed the thatched roof and practically all the woodwork of the cellar. After the fire, a corrugated iron roof was erected with a new loft. The original cobbled stone floor in the one wing was replaced with a wooden post floor (to dampen the sound of horses' hooves) and can still be seen today.

In 2000, the historical cellar was renovated and converted into offices and conference facilities. The facade was restored to its former dignity while the interior was minimally altered to retain the atmosphere of historic Cape Dutch buildings. The 'T'-shape cellars consist of three wings. The central wing, the stem of the 'T' appears to be the oldest part of the 18th century structure. Some of the original vents are still visible. All the walls have a thickness of approximately 530mm and the front gable dates back to 1821 along with the neo-classical end gables, of the same period.



Top to bottom: The weeds pathology building as it looked in the 1920's and later renovated which an added extension lead to the lost of the gable



The recently upgraded weeds division pathology section's glasshouses



The current admin building

PHP Facilities

Cedara Weeds Research Station

The Weeds Laboratory at Cedara, outside Pietermaritzburg in KwaZulu-Natal, opened in 1983 as a centre for research on herbicides, weed ecology and physiology, and integrated weed management planning.

The laboratory was initially housed in a prefabricated structure headed by Dr Daniel Erasmus, with early researchers such as Dr Peta Campbell, Dr Jeremy Goodall and Mr Robin Denny, with research focusing on weeds such as *Solanum mauritianum* (bugweed), *Lantana camara*, *Rubus cuneifolius* (American bramble) and *Chromolaena odorata* (trifid weed).

Dr Rob Kluge arrived from the Stellenbosch laboratory in 1988 to initiate a biological control programme on *C. odorata*, the same year that the current building (A-block – and the following year B-block) was completed. Dr Kluge went on to become head of the laboratory.

The 1990s saw substantial changes to the role of the Cedara Weeds Laboratory, in particular the growth of the biocontrol work, with the addition of a project on bugweed, and the erosion of funding for non-biocontrol work. The latter was caused by, inter alia, competition from private herbicide companies and other research institutions. The year 1992 was a milestone year as the ARC was formed, and by default the laboratory became a guest section on state-owned land (the Cedara Agricultural College farm, later also the provincial Department of Agriculture headquarters). Mr Robin Denny and then Dr Terry Olckers headed up the laboratory during this decade.

During the following two decades, biocontrol research and implementation of this research grew further. A custom-built quarantine facility erected by the provincial Department of Agriculture for use by ARC opened in 2008. This, together with generous funding from the *Working for Water (WfW)* programme (initially under the national Department of Water Affairs and later the national Department of the Environment) allowed for new biocontrol projects to be undertaken on weeds such as *Parthenium hysterophorus* (famine weed), *Campuloclinium macrocephalum* (pompom weed) and *Arundo donax* (giant or Spanish reed).

Research was also conducted on various aspects of the ecology and management of pompom. Towards the end of the 2010s and into the current decade, funding for biocontrol from the WfW programme became less stable, necessitating a shift in focus to other funders.



Top and bottom: The original weeds building in 1988 and new quarantine labs added to the site



Top to bottom: Construction started on the new quarantine labs (2007) and completed by 2008.



PHP Facilities

Biosystematics, relocated to ARC Roodeplaat West Campus

The year 2009 was a milestone in the long history of the national public good assets. These assets include the collections in the units of fungi, entomology, nematology and arachnology. This group relocated to its new premises on the ARC-Roodeplaat West Campus, some 25 km north of Pretoria. So during October and November 2009 the units finally moved to the newly build PHP Biosystematics building, which now houses collectively the National Collections of Arachnids, Insects, Nematodes, and Fungi all under one roof.

The new building was custom-designed to meet international standards for collection storage. Great attention has been paid to guarantee the safety of the collections. Access control, alarm systems, and perimeter fencing ensure that the building is secured against intruders. The installation of sophisticated fire-detection and elimination systems, including an on-site water reservoir, form an elaborate mechanism to protect the building and its irreplaceable biological reference resources. Power outages are coped with by an on-site generator and dedicated network plugs.

Rooms housing alcohol collections have been designed to reduce the risk of fires with special flooring and concrete ceilings, whereas live fungal culture collections are maintained in a controlled environment. Temperature control systems ensure that the specimens are housed at the optimum conditions, and this extends to each office which makes for a very pleasant working environment. Each scientist and technician has their own laboratory office fitted with benches and cabinets to suit their particular needs, and there is extensive built-in storage for literature collections. Great care was taken with the ergonomics of the building to ensure that each scientist sits in an office located across the passage from the collection for which they are responsible.

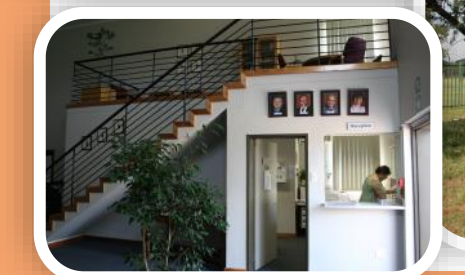
Individual sections house specialised specimen preparation and extraction rooms. Dedicated molecular techniques rooms, and digital photographic rooms are available to all sections. A special vault also ensures the safety of irreplaceable type specimens.

***Clockwise:** The generator house (for continues electricity), the high pressure pump station and water reservoir for fire system and biosystematics reception*

Saying goodbye to the movers!



Top to bottom: Relocation of the Biosystematics Division staff and collections to west campus



PHP Facilities



From top: PHP reception, Mr Mike Walters (director at the time) and contractors inspecting the building sites



An aerial view of the current campus



The new weeds quarantine building

PHP Roodeplaat East Campus (Main campus)

ARC-PPRI acquired what is now known as the main campus of approximately 68ha at Roodeplaat, Pretoria in December 1994. It is in close proximity to the Roodeplaat dam wall.

The vast laboratory complex previously housed a military funded company—Roodeplaat Research Laboratories (RRL) under leadership of Dr Wouter Basson, from 1983 until 1993 at this site.

The original farm house and family graveyard where still present on the farm, near the river crossing over the property and flowing from the Roodeplaat dam. The family graveyard is still on the property today.

From the beginning, a lot of changes had to be made to the existing laboratories and offices and glass houses had to be added to the existing buildings. Occupation of the building came only much later with the different units moving in stages as the building works were completed. Starting with all the units still housed in the old department of Agricultural building moving first to the new location.

Only by mid-year 2015, were most of the Rietondale research staff and equipment successfully transferred to the Roodeplaat campus, partly to pre-existing offices and greenhouses.

New Roodeplaat Weeds Quarantine & Nursery Buildings

The reason for relocating was that the Rietondale quarantine facilities has been in use for well over 30 years and were coming to the end of their life span. The facility had become increasingly inefficient and unreliable, and due to its age, running costs and maintenance expenses. The commissioning of the new facility at ARC Roodeplaat enabled the Weeds Research Division to continue with biological control research safely and cost-effectively, and in a manner consistent with international quarantine standards and best-practices. Furthermore, the move allowed the ARC to consolidate the majority of its facilities and research institutions in close proximity to one another, boost the critical mass of researches at the PHP Roodeplaat east campus, and situate the new buildings on ARC owned land.

The primary goal for the new weeds quarantine facility at Roodeplaat was to replace the old Rietondale laboratories with a modern facility compliant with current quarantine regulations, but that would still be conducive to insect rearing and plant propagation. Furthermore, every effort was made to construct a 'green building', which would be energy efficient, require minimal maintenance, and would therefore be cost effective to run. Central to this was the selection of evaporative cooling as the primary means of cooling used throughout the building. Compared to traditional air conditioning systems that utilise refrigerants and



Gawie and Sannie van Molendorff, previous owners of the original farm

PHP Facilities



Top to bottom: The new weeds quarantine and nursery buildings under construction

compressors, evaporative cooling is far more sustainable, requiring significantly less power to operate and only periodic and relatively inexpensive maintenance. This enables the entire facility to operate normally on a single generator so that cooling is unaffected during a power failure, a necessity in quarantine glasshouses and something that was not possible before at Rietondale. The decision to use evaporative cooling had a large impact on the design and eventual operational capabilities of the facility. As this cooling technique requires large volumes of air to move through each glasshouse, all ducting had to be carefully screened off to ensure containment. These screening requirements mean that only insects in excess of 0.18mm in size can be safely contained and worked on in most areas of the facility. In order to facilitate work on smaller arthropods such as mites, an additional high-level containment section was incorporated into the design of the facility, employing high efficiency particulate air (HEPA) filtration of all exhaust air. Numerous features like this were incorporated into the design of the building in order to allow the facility to address all the needs of the Weeds Research Division at the time, as well as to provide for future expansion and/or changes in the scope of work.

The Weeds Research Quarantine facility was officially opened on 23 November 2015 by the Minister of Agriculture, Forestry and Fisheries Mr Senzeni Zokwana. The facility has a footprint of over 1160m² comprising 16 glasshouse compartments, nine laboratories, a controlled environment room, microscopy room, a laundry and storeroom, toilet facilities, cold-room, fumigation facilities and an adjoining non-quarantine anteroom with a pass-through autoclave. An adjacent non-quarantine nursery was also built providing a total of 1200m² of covered floor space under automated irrigation on which to propagate test-plant species as well as plants needed to feed the quarantine insect cultures. The nursery structure has an adjoining soil-preparation and equipment storage area as well as rainwater harvesting and storage facilities.

The goal for this facility was to remain up to date and compliant with current international quarantine standards and best practices, while building a 'green building' which is energy efficient, will require minimal maintenance, and is cost effective to run. It also incorporate intelligent design features such as built in redundancy to allow for future expansion and changes in the scope of our work, or changes to local quarantine standards and legislation and thus producing a secure facility that enables effective plant propagation and insect culturing.

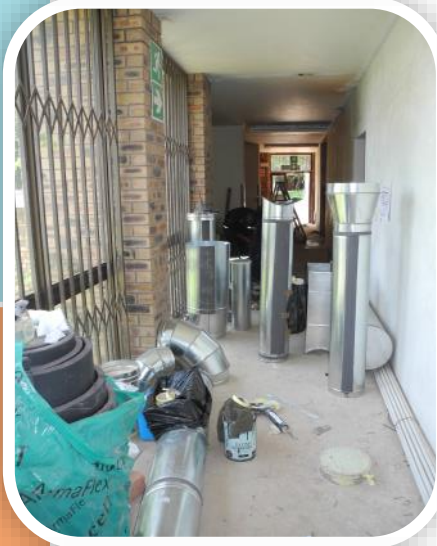
And so began the new chapter of ARC-Plant Health and Protection with most of its units now only situated over three provinces and on four campuses.



PHP Facilities



Top to bottom: The existing building being transformed and upgraded to a Biosafety Level 3 quarantine facility



PHP Roodeplaas East - Plant Pathogen Quarantine Facility upgrade

National food security has been identified as a priority goal for the ARC with focused research on the genetic improvement of crops and livestock, as well as the anticipation and mitigation of emerging agricultural risks. In order to address these challenges, the ARC - Plant Health and Protection has undertaken to upgrade a laboratory complex at their Roodeplaas campus to an operational plant pathogen research facility with Biosafety Level 3 (BSL 3) quarantine capabilities. Such a facility will enable South African plant breeders and scientists to conduct research on emerging microbial pests and diseases under strictly contained and controlled growing environments, work not possible in the country at present. This research will pre-empt or 'prepare' the country for the arrival of new pests and diseases by incorporating resistance and/or tolerance against these anticipated threats by developing new resistant breeding lines and hybrids of agronomical and horticultural crops. The envisioned facility will provide the following services and greatly improve research progress in:

- Studies of pathogen-host interactions for disease mitigation.
- Host-range testing in support of invasive weed biological control.
- Host-vector transmission studies.
- Screening of breeding lines against agriculturally important diseases under quarantine conditions.
- Diagnostic services and method validation.
- Production of infected seed lots and subsequent development and validation of detection protocols for various fungal and bacterial pathogens and viruses.
- Fungicide efficacy and resistance.
- Testing of chemical and biological products on crops for increased yield and disease resistance.

The refurbishment project aims to upgrade an old laboratory complex that has fallen into disrepair. Additionally, the new design also incorporates adjacent laboratories that will provide additional research space and consolidate everything into a single, modern Biosafety Level 3 quarantine facility. Renovations and technical upgrades to existing features, as well as the inclusion of some additional equipment will return the facility to a fully operational state that adheres to international quarantine standards and best practice. Together with associated infrastructure including glasshouses, insect culture rearing rooms and mass-rearing facilities, as well as the invasive weed biocontrol quarantine facility for insects, already present at ARC-PHP, this facility is anticipated to provide a one-stop solution to government and the agricultural industry in South Africa for all plant health requirements.

This project is scheduled and on track to be completed by the March of 2024.